



PHCC Academy® HVAC 101 Syllabus

Prerequisites

None

Welcome to the PHCC Academy™ Online Apprenticeship-Related Instruction Program!

This program is designed to provide students who cannot attend classes in a traditional apprentice program with the same opportunity to learn the textbook fundamentals of the trade. This training course must be supplemented by your employer, through both technical assistance and on-the-job training in each area of instruction in the book.

Course Goals

- To provide a practical introduction to the HVACR trade
- To familiarize entry-level students with a broad overview of fundamental topics in the HVACR industry
- To provide students with an understanding of energy efficiency concerns in the HVACR field
- To provide students with an understanding of the fundamentals of selling and customer service

Student Responsibilities

- Complete work in a timely manner.
- Read all information and assignments within the learning management system before starting the course.
- Complete all tests in this course as closed-book. Students are on the honor system.
- Complete all assignments with a passing grade of 70 percent or higher.
- Complete the course in 1 year (12 months) or request a 6-month extension before the course expiration date.
- Maintain records of on-the-job training completed.

Employer Responsibilities

- Ensure that all students enrolled are proficient in reading and writing in English at a high school level and possess the self-motivation to complete internet-based coursework.
- Register apprentices with the U.S. Department of Labor, either through your own apprenticeship program or through your PHCC State Chapter Partner's registered apprenticeship program.
- Track the apprentice's on-the-job training hours and document such hours. Documentation records must be maintained by the employer for the duration of the apprentice's employment and must be retained as required by the U.S. Department of Labor.
- Ensure that apprentices are paid a progressively increasing schedule of wages and fringe benefits based on a percentage of the current journey worker wage rate as specified in the Standards of Apprenticeship for the program under which the apprentice is participating.



Required Textbook (Purchased Separately)

Moravek, Joseph (2008). HVACR 101, 1st ed. Clifton Park, NY: Delmar, Cengage Learning.

Assignments

Unit 1 – Introduction to HVACR Concepts

Read Chapter 1 in the HVACR 101 textbook.

Video – Heating and Air Conditioning Fire and Ice

Chapter 1 Review PowerPoint

Read Chapter 2 in the HVACR 101 textbook.

Video – Refrigeration Cycle

Chapter 2 Review PowerPoint

Unit 1 Exam

Unit 2 – First Aid and Safety

Read Chapters 1-12 in the First Aid Manual (found in course).

Video – First Aid in Construction

Video – Safety Music Video

First Aid Review PowerPoint

Safety and First Aid Review Game

Unit 2 Exam

Unit 3 – Basic Electricity

Read Chapter 3 in the HVACR 101 textbook.

Video – Introduction to Circuits and Ohm's Law

Video – Electric Power

Video – Voltmeter and Ammeter

Chapter 3 Review PowerPoint

Unit 3 Exam

Unit 4 – Basic Thermodynamics

Read Chapter 4 in the HVACR 101 textbook.

Video – Thermal Conduction, Convection, and Radiation

Video – Specific Heat and Latent Heat of Vaporization/Fusion

Video – First Law of Thermodynamics

Video – Second Law of Thermodynamics

Video – Boyle’s Law

Video – Charles’ Law

Video – Dalton’s Law

Chapter 4 Review PowerPoint

Unit 4 Exam

Unit 5 – Basic Refrigeration Cycle

Read Chapter 5 in the HVACR 101 textbook.

Video – PT Chart 101

Video – Scroll Compressors for Refrigeration Applications

Video – Evaporator Coil and Air Handler Assembly

Chapter 5 Review PowerPoint

Refrigeration Cycle Review Game

Unit 5 Exam

Unit 6 – Scheduled Maintenance and Systematic Problem Solving

Read Chapter 6 in the HVACR 101 textbook.

Chapter 6 Review PowerPoint

Read Chapter 7 in the HVACR 101 textbook.

Video – Common Summer HVAC Problems

Video – Is It an Airflow Problem?

Chapter 7 Review PowerPoint

Unit 6 Exam



Unit 7 – Installation and Repair Methods

Read Chapter 8 in the HVACR 101 textbook.

Video – Brazing

Video – Tube Flaring Techniques

Video – Hand and Power Tool Safety

Chapter 8 Review PowerPoint

Unit 7 Exam

Unit 8 – Energy Efficient Installation, Selling and Customer Service

Read Chapter 9 in the HVACR 101 textbook.

Video – Energy Efficient Measurements

Chapter 9 Review PowerPoint

Read Chapter 10 in the HVACR 101 textbook.

Video – Customer Service Teamwork

Video – Customer Service Leadership

Video – Customer Service Persuasion

Video – Customer Service Superiority

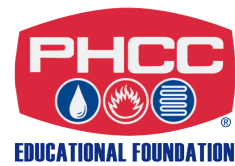
Video – Tech Best Practices

Chapter 10 Review PowerPoint

Unit 8 Exam

Final Exam

Course Evaluation



PHCC Academy® HVAC 201 Syllabus

Prerequisites

HVAC 101 or equivalent

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This program is designed to provide students who cannot attend classes in a traditional apprentice program with the same opportunity to learn the textbook fundamentals of the trade. This training course must be supplemented by your employer, through both technical assistance and on-the-job training in each area of instruction in the book.

Course Goals

- To provide a more detailed introduction to HVACR systems and components
- To familiarize students with proper troubleshooting techniques
- To familiarize students with proper installation techniques
- To provide an introduction to psychometrics
- To provide an introduction to basic sizing techniques

Student Responsibilities

- Complete work in a timely manner.
- Read all information and assignments within the learning management system before starting the course.
- Complete all tests in this course as closed-book. Students are on the honor system.
- Complete all assignments with a passing grade of 70 percent or higher.
- Complete the course in 1 year (12 months) or request a 6-month extension before the course expiration date.
- Maintain records of on-the-job training completed.

Employer Responsibilities

- Ensure that all students enrolled are proficient in reading and writing in English at a high school level and possess the self-motivation to complete internet-based coursework.
- Register apprentices with the U.S. Department of Labor, either through your own apprenticeship program or through your PHCC State Chapter Partner's registered apprenticeship program.
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- Track the apprentice's on-the-job training hours and document such hours. Documentation records must be maintained by the employer for the duration of the apprentice's employment and must be retained as required by the U.S. Department of Labor.
- Ensure that apprentices are paid a progressively increasing schedule of wages and fringe benefits based on a percentage of the current journey worker wage rate as specified in the Standards of Apprenticeship for the program under which the apprentice is participating.



Required Textbook (Purchased Separately)

Moravek, Joseph and Hohman, John (2009). HVACR 201, 1st ed. Clifton Park, NY: Delmar, Cengage Learning.

Assignments

Unit 1 – Refrigeration Cycle Review, Compressors, and Refrigerants and Lubrication

Read Chapter 1 in the HVACR 201 textbook.

Chapter 1 Review PowerPoint

Read Chapter 2 in the HVACR 201 textbook.

Chapter 2 Review PowerPoint

Read Chapter 3 in the HVACR 201 textbook.

Video – Effective Refrigerant Recovery Techniques Part 1

Video – Effective Refrigerant Recovery Techniques Part 2

Chapter 3 Review PowerPoint

Unit 1 Exam

Unit 2 – Condensers and Metering Devices

Read Chapter 4 in the HVACR 201 textbook.

Video – How It's Made: Evaporative Cooling Towers

Chapter 4 Review PowerPoint

Read Chapter 5 in the HVACR 201 textbook.

Video – TXV Manufacture

Video – EEV Operation

Chapter 5 Review PowerPoint

Unit 2 Exam

Unit 3 – Refrigeration Accessories and Evaporators

Read Chapter 6 in the HVACR 201 textbook.

Video – Heat Pump Reversing Valve Operation

Chapter 6 Review PowerPoint

Read Chapter 7 in the HVACR 201 textbook.

Chapter 7 Review PowerPoint

Unit 3 Review Game

Unit 3 Exam

Unit 4 – Evacuation and Charging Procedures

Read Chapter 8 in the HVACR 201 textbook.

Video – Evacuation Part 1

Video – Evacuation Part 2

Chapter 8 Review PowerPoint

Unit 4 Exam

Unit 5 – Heating

Read Chapter 9 in the HVACR 201 textbook.

Video – Sequence of Operation for a Gas Furnace

Video – Carbon Monoxide Safety Tips

Chapter 9 Review PowerPoint

Unit 5 Exam

Unit 6 – Electrical and Electrical Troubleshooting

Read Chapter 10 in the HVACR 201 textbook.

Chapter 10 Review PowerPoint

Read Chapter 11 in the HVACR 201 textbook.

Video – Troubleshooting Electric Circuits

Chapter 11 Review PowerPoint

Unit 6 Exam



Unit 7 – Introduction to Motors

Read Chapter 12 in the HVACR 201 textbook.

Video – How it Works: Electric Motors

Video – Common HVAC Motors

Chapter 12 Review PowerPoint

Unit 7 Exam

Unit 8 – Cooling Equipment and Mechanical Troubleshooting

Read Chapter 13 in the HVACR 201 textbook.

Video – Installing a Ductless Mini Split System

Video – How a Chiller and Cooling Tower Work Together

Video – Heating, Chillers, and the Economizer Cycle

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Chapter 13 Review PowerPoint

Read Chapter 14 in the HVACR 201 textbook.

Chapter 14 Review PowerPoint

Unit 8 Exam

Unit 9 – Advanced Installation Techniques and Control Systems

Read Chapter 15 in the HVACR 201 textbook.

Video – Duct Sealing

Chapter 15 Review PowerPoint

Read Chapter 16 in the HVACR 201 textbook.

Chapter 16 Review PowerPoint

Unit 9 Exam



Unit 10 – Psychrometrics and Basic Sizing

Read Chapter 17 in the HVACR 201 textbook.

Video – Reading a Psychrometric Chart

Chapter 17 Review PowerPoint

Read Chapter 18 in the HVACR 201 textbook.

Chapter 18 Review PowerPoint

Psychrometric Chart Reading Review Game

Unit 10 Exam

Final Exam

Course Evaluation

**Certificate of Achievement received by Indiana PHCC for
Completion of 2 Year Training Course**